



## The benefits of transmission dynamics models in understanding emerging infectious diseases

---

**Author(s):** Wendelboe AM, Grafe C, Carabin H  
**Year:** 2010  
**Journal:** The American Journal of The Medical Sciences. 340 (3): 181-186

---

### Abstract:

Factors associated with the emergence and transmission of infectious diseases often do not follow the assumptions of traditional statistical models such as linearity and independence of outcomes. Transmission dynamics models are well suited to address infectious disease scenarios that do not conform to these assumptions. For example, these models easily account for changes in the incidence rates of infection as the proportions of susceptible and infectious persons change in the population. Fundamental concepts relating to these methods, such as the basic reproductive number, the effective reproductive number and the susceptible-infected-recovered compartmental models, are reviewed. In addition, comparisons and contrasts are made between the following concepts: microparasites and macroparasites, deterministic and stochastic models, difference and differential equations and homogeneous and heterogeneous mixing patterns. Finally, examples of how transmission dynamics models are being applied to factors associated with emerging infectious diseases, such as zoonotic origins, microbial adaption and change, human susceptibility and climate change, are reviewed.

**Source:** <http://dx.doi.org/10.1097/MAJ.0b013e3181e937ca>

### Resource Description

#### Exposure :

weather or climate related pathway by which climate change affects health

Unspecified Exposure

#### Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

#### Geographic Location:

resource focuses on specific location

Global or Unspecified

#### Health Impact:

specification of health effect or disease related to climate change exposure

# Climate Change and Human Health Literature Portal

Infectious Disease

**Infectious Disease:** General Infectious Disease

**Mitigation/Adaptation:** ☐

mitigation or adaptation strategy is a focus of resource

Adaptation

**Model/Methodology:** ☐

type of model used or methodology development is a focus of resource

Methodology, Outcome Change Prediction, Other Projection Model/Methodology

**Other Projection Model/Methodology:** transmission dynamics models

**Resource Type:** ☐

format or standard characteristic of resource

Research Article, Review

**Timescale:** ☐

time period studied

Time Scale Unspecified